



**King County**  
**Department of Development**  
**and Environmental Services**  
 900 Oakesdale Avenue Southwest  
 Renton, WA 98057-5212  
 206-296-6600 TTY 206-296-7217

2006 Washington State Energy Code  
 2006 Ventilation and Air Quality Code

## ENERGY RESIDENTIAL SUBMITTAL FORMS: All heat types

For alternate formats, call 206-296-6600.

Applicant's name \_\_\_\_\_  
 K.C. tracking no. \_\_\_\_\_

### ENERGY RESIDENTIAL SUBMITTAL FORMS: ALL HEAT TYPES

#### GENERAL INFORMATION

Check all appropriate boxes

**Job type:** ☐ New ☐ Addition ☐ Remodel ☐ Conditioned sq. ft. \_\_\_\_\_

**Occupancy:** ☐ Single family ☐ Multi-family ☐ Number of units \_\_\_\_\_  
 Number of buildings: \_\_\_\_\_

**Heating fuel:** ☐ Electric ☐ Gas ☐ Oil ☐ LPG (Propane) ☐ Other \_\_\_\_\_

**Heating system:** ☐ Forced air ☐ Room heaters ☐ Hydronic ☐ Other \_\_\_\_\_

#### WHOLE HOUSE VENTILATION SYSTEMS

Check the "whole house ventilation system" that will be used

- ☐ Intermittent whole house ventilation using exhaust fans (FORM # VIAQ 2, [PDF](#) or [Word](#) format)  
**NOTE:** Exhaust only ventilation systems do not require outdoor air inlets if the home has a ducted forced air heating system that communicates with all habitable rooms and the interior doors are undercut to a minimum of ½ - inch above the surface of the finish floor covering.
- ☐ Intermittent whole house ventilation integrated with a forced-air system (FORM # VIAQ 3, [PDF](#) or [Word](#) format)
- ☐ Intermittent whole house ventilation using a supply fan (FORM # VIAQ 4, [PDF](#) or [Word](#) format)
- ☐ Intermittent whole house ventilation using a heat recovery ventilation system (FORM # VIAQ 5, [PDF](#) or [Word](#) format)
- ☐ Engineered "whole house ventilation system" designed in compliance with Section 302, WAC-51-13
- NOTE:** In addition to the required "whole house ventilation system," "source specific exhaust ventilation" is required in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and other rooms where excess water vapor or cooking odor is produced.

#### EXEMPT FROM WHOLE HOUSE VENTILATION SYSTEMS

If applicable, check one of the following

- ☐ Building additions with less than 500 square feet of conditioned floor area.
- ☐ Replacement of air-handling/conditioning equipment without altering or repairing the associated air distribution system.

#### VAPOR RETARDER

Check the type of "vapor retarder" that will be used

**Floor:** ☐ 4 mil Poly ☐ Face stapled backed batts ☐ Ext. T&G Plywood

**Wall:** ☐ 4 mil Poly ☐ Face stapled backed batts ☐ PVA - paint

**Ceiling:** ☐ 4 mil Poly ☐ Face stapled backed batts ☐ PVA - paint

## 2006 WSEC Chapter 6 Qualification Form - Zone 1, Residential Prescriptive Options for All Heat Sources <sup>0,1</sup>

### Instructions:

- 1 Carefully review the requirements for each of the options below. Choose an option that best suits your dwelling design. Glazing percentage typically determines which option to choose. Your building must match the selected option requirements without exceptions or substitutions.  
**Most applicants select Option IV.**
- 2 Check the box ( ☐ ) above the requirements of your option. Disregard components or equipment that do not apply to your project. Your permit will be processed more efficiently if you provide all of the requested information. Department staff can help you with general questions about this form.

**Can't Comply?** If none of the Prescriptive (Chapter 6) options are acceptable, consider the Component Performance (Chapter 5) Approach. The main advantage is flexibility to juggle individual R and U-factors as long as an overall maximum value isn't exceeded. Note that the Component Performance requirements are no less stringent than the Prescriptive requirements. Worksheets and additional information about Chapter 5 WSEC are available on the Washington State University Energy Program Web site at:

[www.energy.wsu.edu/code](http://www.energy.wsu.edu/code)

Select One →	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	OPT IV	OPT I	OPT II*	Footnotes
Glazing Maximum % of floor area <sup>10</sup>	Unlimited Group R-3 Occupancy only	10%	15%	*Reference Case  0. Nominal R-values are for wood frame assemblies only or assemblies built in accordance with Section 601.1.  1. Minimum requirements for each option listed. If a proposed design has a glazing ratio of 13% to the conditioned floor area it shall comply with all of the requirements of Option II. If these options do not describe one or more of your design's elements Chapter 4 or 5 of the WSEC provides a component analysis method for compliance. Please attach your analysis to this form.  2. Requirement applies to all ceilings except single rafter or joist vaulted ceilings complying with note 3. 'Adv' denotes Advanced Framed Ceiling.  3. Requirement applicable only to single rafter or joist vaulted ceilings where both (a) the distance between the top of the ceiling and the underside of the roof sheathing is less than 12 inches and (b) there is a minimum 1-inch vented airspace above the insulation. Other single rafter or joist vaulted ceilings shall comply with the "ceiling" requirements. This option is limited to 500 square feet of ceiling area for any one dwelling unit.  4. Below grade walls shall be insulated either on the exterior to a minimum level of R-10, or on the interior to the same level as walls above grade. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See Section 602.2.  5. Floors over crawl spaces or exposed to ambient air conditions. 6. Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See Section 602.4 7. Not used in climate zone one. 8. Not used in climate zone one.  9. Doors, including all fire doors, shall be assigned default u-factors from Table 10-6C. 10. Where a maximum glazing area is listed, the total glazing area (combined vertical + overhead) as a percent of gross conditioned floor area shall be less than or equal to that value. Overhead glazing with U-factor of U=0.40 or less is not included in glazing area limitations. 11. Overhead glazing shall have U-factors determined in accordance with NFRC 100 or as specified in Section 502.1.5. 12. Log and solid timber walls with a minimum average thickness of 3.5" are exempt from this insulation requirement.
Vertical Glazing U-Factor	0.35	0.32	0.35	
Overhead Glazing U-Factor <sup>11</sup>	0.58	0.58	0.58	
Door U-factor <sup>9</sup>  (or R-factor)	0.20  (R-5)	0.20  (R-5)	0.20  (R-5)	
Ceilings: With attics <sup>2</sup> Vaulted <sup>3</sup>	R-38 R-30	R-38 R-30	R-38 R-30	
Walls: above grade <sup>12</sup> below grade <sup>4</sup> interior or exterior	R-21  R-21 R-10	R-15  R-15 R-10	R-21  R-21 R-10	
Floor: <sup>5</sup>	R-30	R-30	R-30	
Slab on grade: <sup>6</sup>	R-10	R-10	R-10	

## 2006 Residential WSEC Chapters 5 and 6 Heating System Sizing

The 2006 Washington State Energy Code (WSEC) requires that heating and cooling systems for residential projects to be sized. With few exceptions heating and cooling systems may not exceed 150% of the design loads as calculated per the 2006 WSEC.

This form will only size an electric, natural gas, LPG or oil fired heating system when all the required information has been filled out. The type of insulation and areas involved, skylights, doors, and window sections of this form must be completed accurately.

If your system provides cooling it must be sized using ASHRAE Manual J or equivalent calculations and they must be attached to this form. Please contact your mechanical contractor for this information

**Please read and check the appropriate box below and then either complete the remainder of this form or attach the required alternative calculations.**

**A** I am using this form to define the project, propose a whole house ventilation method, vapor retarders, prescriptive path for R-Values for insulation and U-values for doors and windows, and to size the heating system.

**B** I am using this form to define my project and propose the whole house ventilation, vapor retarders, prescriptive path for the R-Values of insulation and U-values for doors and windows, and to size the heating system.

The heating system installed will be fueled by natural gas or oil with an annual fuel utilization efficiency (AFUE) of 90% or greater. The minimum heat output of the heating system may be exceeded by no more than 250%.

**C** This project is using a Manual J or an approved equivalent method for sizing the heating system. I have filled out the first two pages of this form and attached the form that sizes my equipment .

**D** This project is using a heating and cooling system. A Manual J or an approved equivalent method for sizing the heating and cooling system is attached. I have filled out the first two pages of this form and attached the form that sizes my equipment .

**E** This project is using a heating system fueled by natural gas or oil, is less than 1500 sq.ft. in size, and is in compliance with Prescriptive Path Option IV. A heating system not to exceed 40,000 Btu/H total output will be installed. The following Heating System sizing calculations are not required to be completed.

When using Manual J or an approved equivalent method for sizing a heating system the first two pages of this form must be completed to identify the project, proposed method for whole house venting, vapor barriers and prescriptive path based on the type of energy used for heating, Or attach the Component Performance analysis per (Chapter 5) to this form.

**The following Outdoor Design Temperatures are from the Washington State Energy Code. Use the temperature next to the city or area that is closest to your project.**

( Register plans may use a default outdoor design temperature of 22 )

Auburn	25	Renton	24
Bellevue	24	Seattle	24
Bothell	17	Snoqualmie Falls	22
Enumclaw	26	Snoqualmie Pass	6
Issaquah	23	Stevens Pass	6
Kent	21	Tukwila	24
Redmond	17	Vashon Island	28

## Simple Heating System Size: Climate Zone 1

Indoor Design Temperature	<input type="text" value="70"/>
Outdoor Design Temperature	<input type="text"/>
Design Temperature Difference	<input type="text"/>
Indoor - Outdoor Design Temp	
Conditioned Floor Area	<input type="text"/>
Conditioned Volume (CV)	<input type="text"/>

Attic	U-Factor	X	Area	=	UA
R-38	0.031		<input type="text"/>		<input type="text"/>
R-38 Scissor	0.035		<input type="text"/>		<input type="text"/>
R-38 Advanced	0.026		<input type="text"/>		<input type="text"/>
Other	<input type="text"/>		<input type="text"/>		<input type="text"/>

Single Rafter Joist	U-Factor	X	Area	=	UA
R-30	0.034		<input type="text"/>		<input type="text"/>
R-38	0.027		<input type="text"/>		<input type="text"/>
Other	<input type="text"/>		<input type="text"/>		<input type="text"/>

Above Grade Walls	U-Factor	X	Area	=	UA
R-21- lapped siding	0.057		<input type="text"/>		<input type="text"/>
R-21 T-111 siding	0.060		<input type="text"/>		<input type="text"/>
Other	<input type="text"/>		<input type="text"/>		<input type="text"/>

Glazing					
Sum of UA from Glazing (doors, vertical, overhead, and single) pgs 5-6					<input type="text"/>

Floors	U-Factor	X	Area	=	UA
R-30	0.029		<input type="text"/>		<input type="text"/>
Other	<input type="text"/>		<input type="text"/>		<input type="text"/>

Below Grade Walls	U-Factor	X	Area	=	UA
R-21 interior	0.037		<input type="text"/>		<input type="text"/>
R-10 exterior	0.056		<input type="text"/>		<input type="text"/>
Other	<input type="text"/>		<input type="text"/>		<input type="text"/>

Slab Below Grade	F-factor	X	Length	=	UA
R-21 interior walls	0.57		<input type="text"/>		<input type="text"/>
R-10 exterior walls	0.42		<input type="text"/>		<input type="text"/>
Other	<input type="text"/>		<input type="text"/>		<input type="text"/>

Slab on Grade	F-factor	X	Length	=	UA
R-10 perimeter insulation	0.54		<input type="text"/>		<input type="text"/>
R-10 Full insul. - Heated slab	0.51		<input type="text"/>		<input type="text"/>
Uninsulated slab	0.73		<input type="text"/>		<input type="text"/>
Other	<input type="text"/>		<input type="text"/>		<input type="text"/>

Sum of UA	<input type="text"/>
-----------	----------------------

Envelope Heat Load	<input type="text"/> Btu / Hour	÷ 3413 =	<input type="text"/> KW
--------------------	---------------------------------	----------	-------------------------

Sum of UA X Design Temperature Difference

Convert Btu / hr to electric KW: Btu ÷ 3413

Air Leakage Heat Load	<input type="text"/> Btu / Hour	<input type="text"/> KW
-----------------------	---------------------------------	-------------------------

CV X 0.6 X Design Temperature Difference X .018

Building Design Heat Load	<input type="text"/> Btu / Hour	<input type="text"/> KW
---------------------------	---------------------------------	-------------------------

Air Leakage + Envelope Heat Load

Minimum Heating Equipment Output	<input type="text"/> Btu / Hour	<input type="text"/> KW
----------------------------------	---------------------------------	-------------------------

Building Design Heat Load x 1.15 or 1

Use 1.15 if ducts are located in unconditioned space: Sum of Building Heat Loss X 1.15

Use 1 if ducts are located in conditioned space: Sum of Building Heat Loss X 1

Maximum Heating Equipment Output	150%	<input type="text"/> Btu / Hour	<input type="text"/> KW
----------------------------------	------	---------------------------------	-------------------------

Minimum Heating Equipment Output X 1.50

Increase Maximum Heating Equipment Output	<input type="text"/>
---	----------------------

With 90% High Efficiency Furnace: Min output x 2.5

	250%	<input type="text"/>
--	------	----------------------

←	Sum of UA values include
	doors
	vertical glazing
	overhead glazing
	single glazing

## 2006 Residential WSEC Chapter 6:Window, Skylight and Door Schedules

Instructions: This portion of the form must be completed if you are either using the simple heating sizing or if you are using the prescriptive approach Option I or II. Fill out the window and door schedules - use actual NFRC tested U-factor data whenever possible or use the appropriate WSEC Chapter 10 default table. Use the Glazing to Floor Area Calculation to determine your particular prescriptive option.

## Glazing Schedule

Conditioned Floor Area		Sum of UA for Sizing Heating System	
Sum of All Glazing Areas From Below		<b>door UA+ vertical glazing UA + overhead glazing UA + single glazing UA</b>	
<b>Glazing to Floor Area Ratio</b>		602.7.2 Exception Ratio (not to exceed 1%)	
<i>Sum of all glazing ÷ Conditioned floor area</i>		<i>sum of area of single glazing &amp; garden windows ÷ sum of UA above</i>	

## Exterior Doors

[illegible]

Sums of Glazing Area, Door Area, and UA (do not include exempt door)			
Area Weighted U = UA/Area			
Sums of Area and UA for Heating system size only (include exempt door)			

### Vertical Glazing (Windows, Glazed doors using Exception 602.6 #1)

[illegible]

Sums of Area and UA		
Area Weighted $U = UA/Area$		

## Overhead Glazing

Plan	Component	Glazing	
ID	Description	Ref.	U

Qty.	Width		Height	
	Feet	Inch	Feet	Inch

Area	UA

*Sums of Area and UA*  
*Area Weighted U = UA/Area*


## Single Glazing and Garden Windows Section 602.7.2 Exception

Plan	Component
ID	Description

Qty.	Width		Height	
	Feet	Inch	Feet	Inch

Area	UA

*Sum of Area*  
*Sum of Area X 3 (enter this value in the glazing area total)*  
*Glazing UA for Heating System Size Only = Area X 1.2*

UA =	

## Exceptions:

### 602.6 Exterior Doors: Doors shall comply with Section 602.6.1 and 602.6.2

Exceptions:

1. Glazed doors whose area and U-factor are included in the calculations for compliance with the requirements for glazing in Section 602.7 shall be exempt from the door U-factor requirements prescribed in Table 6-1 or 6-2.
2. One unlabeled or untested exterior swinging door with the maximum area of 24 square feet may be installed per unit for ornamental, security, or architectural purposes. Products using this exception shall not be included in either the U-factor or glazing area calculation requirements.

### 602.7.2 Glazing U-factor

Exceptions:

Single glazing for ornamental, security or architectural purposes and double glazed garden windows with a wood or vinyl frame shall be exempt from the U-factor calculations but shall have its area tripled and shall be included in the percentage of the total glazing area as allowed for in Table 6-1 or 6-2. The maximum area (before tripling) allowed for the total of all single glazing windows is 1% of the floor area.